

## PATENT SPECIFICATION

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## COMPLETE SPECIFICATION

### Improvements in or relating to the Removal of Scale from Rolled Metal, more particularly from Billets or Blooms

We, SCHLOEMANN AKTIENGESellschaft, a German company, of Steinstrasse 13, Düsseldorf, Germany, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to means for removing scale from metal in a rolling mill, more particularly from billets or blooms.

The scale-removing means according to the invention comprises grooved or corrugated rolls, the axes of which are inclined to the direction in which the metal to be rolled passes between them, thus tending to deflect the metal from its course, and a guide or abutment to constrain the metal to advance without being deflected, so that between the surfaces to be freed from scale and the surfaces of the rolls a relative slipping occurs, which breaks the scale, and, as it were, scrapes it off.

The means employed for removing the scale according to the invention may vary according as the rolls are arranged above and below the path of the rolled material or on both sides of it.

In the former case, the billets or blooms are fed lying flat to the rolls, the axes of which extend in a horizontal plane obliquely to the direction of passage of the material under treatment. Furthermore, the conveying rollers adjacent to these rolls, upon which the material bears during its passage, through the rolls, are also inclined in the same direction, so that the material, while passing between the rolls, receives a tendency to execute a movement transverse to its direction of running. This gives rise to relative slipping between the surfaces to be freed from scale and the surfaces of the rolls, whereby the scale is broken. In order to stop this transverse movement there is provided upon one side of the conveying rollers an abutment wall, which is preferably equipped, for the purpose of reducing the friction, with projecting roll bodies. The detached scale can be floated away or washed away, by means of a

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scavenging liquid, or removed from the neighbourhood of the rolls in some other way.

Alternatively the rolls may be arranged one on each vertical side of the path of the metal, the billets or blooms in this case being previously placed on edge. The scale-removing rolls are in this case, for the purpose of bringing about the necessary slipping movement, inclined obliquely forward in the direction of running of the rolled material, so that the rolled material receives a downwardly directed component of motion, which is taken up by the conveying rollers themselves. Since the surfaces treated by the rolls are upright, the scale can in this case drop down between the conveying rollers without further difficulty.

It has already been proposed, in a parallel rolling mill for rolling round metal bars, wherein the bar to be rolled is introduced endwise between the ends of a group of at least three rolls to introduce the bar between the rolls by means of screw-threaded frusto-conical extensions of the rolls, and to provide longitudinal notches or teeth on these frusto-conical extensions for the purpose of detaching dross and scale, the axes of the rolls being slightly inclined to the axis of the bar in order not to hinder the advance of the bar by the screw threads, but in this known device no provision is made for causing the work to slip relatively to the screw threads or relatively to the longitudinal notches or teeth.

One arrangement for carrying out the invention is illustrated by way of example in the accompanying drawings, in which Figure 1 is a plan of such an arrangement, and

Figure 2 is a section on the line A-B in Figure 1.

The rolling mill for removing scale according to the invention consists of two rolls 1 and 2, the surfaces of which are grooved, and which are pressed against one another, by springs, for example. Both the rolls are driven, through the medium of pinions 3 and 4 and counter-shaft gearing 5, by a motor 6. The bloom B to be freed from scale is fed to the roll-

ing mill by conveyer rollers 7, this feed being in a direction that is inclined to the axial direction of the rolls 1 and 2. The conveying rollers 8 in the immediate neighbourhood of the rolls 1 and 2 are arranged parallel to the roll axes. Owing to the obliquity of these conveying rollers and of the rolls the rolled material B receives a component of movement transverse to its direction of running. To stop this movement there serves a wall 9, which is arranged beside the path of the rolls, and which for the purpose of reducing the friction, is equipped with somewhat projecting roll bodies 10. Beyond the rolling mill 1, 2 and the conveying rollers 8 there are further conveying rollers 11, which transport the rolled material away.

By arranging the rolls 1 and 2 at an inclination to the direction of travel of the rolled material a relative slipping is obtained, which breaks the scale. The detached scale can be cleared away from the bloom B of scavenging with a washing liquid, by means of an appliance not shown.

Having now particularly described and ascertained the nature of our said invention, and in what manner the same is to be performed, we declare that what we claim is:—

1. Means for removing scale from metal to be rolled, more particularly from billets or blooms, comprising grooved or corrugated rolls, the axes of which are inclined to the direction in which the metal passes between them, thus tending to deflect the metal from its course, and a guide or abutment to prevent the metal from yielding to this tendency, so that

relative slipping occurs between the surfaces to be freed from scale and the surfaces of the rolls, thus breaking the scale.

2. Means for removing scale from metal to be rolled as claimed in claim 1, characterised by the feature that with scale-removing rolls arranged above and below the path of the material, not only these rolls but also the adjacent rollers for conveying the material are inclined to the direction of passage of the latter, so that a tendency is imparted to the material to execute a lateral movement, a vertical abutment being provided beside the conveying rollers for the purpose of stopping this movement.

3. Means for removing scale from metal to be rolled as claimed in claim 2, characterised by the feature that the abutment is a wall equipped with projecting roll bodies for the purpose of reducing the friction.

4. Means for removing scale from metal to be rolled as claimed in claim 1, characterised by the feature that the scale-removing rolls are arranged on both sides of the path of the material, and are inclined forward in the direction of running of the material, so that the material receives a downwardly directed component of motion, the conveying rollers themselves serving as the abutment for stopping this movement.

5. Means for removing scale from metal to be rolled substantially as hereinbefore described with reference to the accompanying drawings.

Dated this 24th day of March, 1937.

MARKS & CLERK.

[This Drawing is a reproduction of the Original on a reduced scale.]

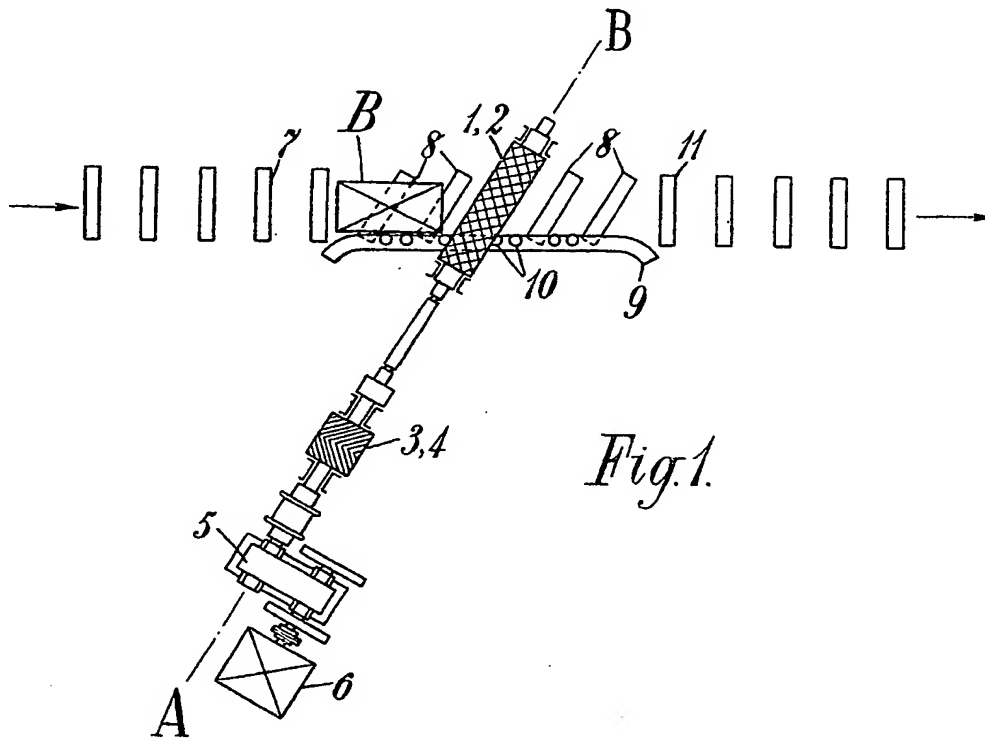


Fig. 1.

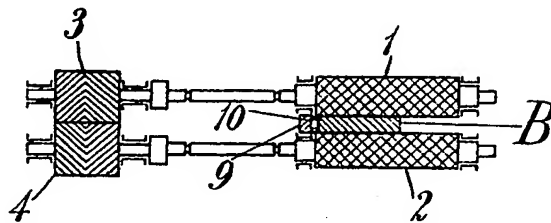


Fig. 2.

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